

REMARKS

Claims 1-24 were pending in this application.

Claims 1-3, 6, 7, 9, 10, 12, 13, 15, 16, 18, 19, and 22-24 have been rejected.

Claims 4, 5, 8, 11, 14, 17, 20, and 21 have been objected to.

Claims 1, 9, 15, and 22 have been amended as shown above.

Claims 1-24 remain pending in this application.

Reconsideration and full allowance of Claims 1-24 are respectfully requested.

I. ALLOWABLE CLAIMS

The Applicants thank the Examiner for the indication that Claims 4, 5, 8, 11, 14, 17, 20, and 21 would be allowable if rewritten in independent form to incorporate the elements of their respective base claims and any intervening claims. Because the Applicants believe that the remaining claims in this application are allowable, the Applicants have not rewritten Claims 4, 5, 8, 11, 14, 17, 20, and 21 in independent form.

II. REJECTION UNDER 35 U.S.C. § 103

The Office Action rejects Claims 1-3, 7, 9, 10, 13, 15, 16, 19, 22, and 23 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Publication No. 2004/0024568 to Eryurek et al. ("*Eryurek*") in view of U.S. Patent Publication No. 2003/0216888 to Ridolfo ("*Ridolfo*"). The Office Action rejects Claims 6, 12, 18, and 24 under 35 U.S.C. § 103(a) as being unpatentable over *Eryurek* and *Ridolfo* in view of U.S. Patent No. 5,750,879 to Ohtsuka et al. ("*Ohtsuka*").

These rejections are respectfully traversed.

In *ex parte* examination of patent applications, the Patent Office bears the burden of establishing a *prima facie* case of obviousness. (MPEP § 2142; *In re Fritch*, 972 F.2d 1260, 1262, 23 U.S.P.Q.2d 1780, 1783 (Fed. Cir. 1992)). The initial burden of establishing a *prima facie* basis to deny patentability to a claimed invention is always upon the Patent Office. (MPEP § 2142; *In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Piasecki*, 745 F.2d 1468, 1472, 223 U.S.P.Q. 785, 788 (Fed. Cir. 1984)). Only when a *prima facie* case of obviousness is established does the burden shift to the Applicant to produce evidence of nonobviousness. (MPEP § 2142; *In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Rijckaert*, 9 F.3d 1531, 1532, 28 U.S.P.Q.2d 1955, 1956 (Fed. Cir. 1993)). If the Patent Office does not produce a *prima facie* case of unpatentability, then without more the Applicant is entitled to grant of a patent. (*In re Oetiker*, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed. Cir. 1992); *In re Grabiak*, 769 F.2d 729, 733, 226 U.S.P.Q. 870, 873 (Fed. Cir. 1985)).

A *prima facie* case of obviousness is established when the teachings of the prior art itself suggest the claimed subject matter to a person of ordinary skill in the art. (*In re Bell*, 991 F.2d 781, 783, 26 U.S.P.Q.2d 1529, 1531 (Fed. Cir. 1993)). To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references

when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed invention and the reasonable expectation of success must both be found in the prior art, and not based on the Applicant's disclosure. (*MPEP* § 2142).

Eryurek recites a diagnostic device that monitors process control devices in a process control system. (*Abstract*; *Par.* [0003]). The diagnostic device includes a signal preprocessor 150, which receives a sensor signal and isolates portions of the signal. (*Par.* [0020]). The signal preprocessor 150 may, for example, perform a wavelet transform to decompose the sensor signal into various decomposition levels. (*Pars.* [0020] and [0027]). A signal evaluator 154 evaluates the isolated portions of the sensor signal and generates an output based on the evaluation. (*Par.* [0020]). For example, the signal evaluator 154 may compare signal strengths for the isolated portions of the sensor signal to various limits, and the signal evaluator 154 outputs various conditions when the limits are exceeded. (*Par.* [0029]).

Claims 1, 9, 15, and 22 recite identifying "one or more indicators of a possible defect in the valve at a plurality of resolution levels" and generating a "plurality of indexes associated with the resolution levels, the indexes ... each identifying a likelihood of a valve defect." Claims 1, 9, 15, and 22 also recite selecting one of the resolution levels "using at least one of the indexes" and determining an "overall probability of a valve defect" using at least one of the indexes that is "associated with the selected resolution level."

First, *Eryurek* does not specifically recite how the isolated portions of the sensor signal are selected. *Eryurek* simply recites that a sensor signal is decomposed into multiple decomposition levels. *Eryurek* then recites that "[a]ll levels, or only those levels which relate

[to] vibration noise signal 132, are provided as isolated signal 152 to signal evaluator 154. For example, depending on the particular system configuration and sensor type, levels 2, 3, and 5 can comprise the isolated signal 152 provided to signal evaluator 154.” (*Par. [0027]*).

At most, this portion of *Eryurek* simply indicates that the various decomposition levels are selected based on the “particular system configuration and sensor type.” This portion of *Eryurek* fails to anticipate generating a “plurality of indexes associated with [a plurality of] resolution levels” and then selecting one of the resolution levels “using at least one of the indexes” as recited in Claims 1, 9, 15, and 22.

Second, *Eryurek* recites that each of the isolated components (such as the decomposition levels shown in Figure 5) has a signal strength that is compared to a limit, and a condition is output if the limit is exceeded. (*Par. [0029]*). In other words, the signal strengths of *Eryurek* are simply used to identify any conditions to be output. The signal strengths of *Eryurek* are not used to select one the decomposition levels. As a result, this portion of *Eryurek* fails to anticipate selecting one of a plurality of resolution levels “using at least one of the indexes” as recited in Claims 1, 9, 15, and 22.

Third, the Office Action acknowledges that *Eryurek* fails to disclose determining an “overall probability of a valve defect” using at least one of the indexes that is “associated with the selected resolution level” as recited in Claims 1, 9, 15, and 22. (*Office Action, Page 3, First paragraph*). The Office Action then asserts that *Ridolfo* discloses these elements and that it would be obvious to combine *Eryurek* and *Ridolfo*. (*Office Action, Page 3, Second paragraph*).

Ridolfo recites a technique for identifying the probability of a sub-system failing and the

probability of an overall system failing. (*Par. [0088]*). However, Claims 1, 9, 15, and 22 recite determining an overall probability of a valve defect using at least one index that is “associated with [a] selected resolution level,” where the indexes are used to select that resolution level. Because of this, it is not sufficient for the Office Action to assert that *Ridolfo* discloses, teaches, or suggests determining an “overall probability of a valve defect.” Rather, the Office Action must show that *Ridolfo* determines the “overall probability of a valve defect” using the same information that was used to select one of the resolution levels. The Office Action does not make this showing.

As described above, *Eryurek* fails to specifically describe how the various decomposition levels are selected. It appears that the decomposition levels are selected based on the “particular system configuration and sensor type.” The Office Action has not established that *Ridolfo* determines an “overall probability of a valve defect” using the “particular system configuration and sensor type.” Also, *Eryurek* recites using signal strengths, but the signal strengths are not used to select the decomposition levels. Even if the signal strengths were used to select the decomposition levels, the Office Action has not established that *Ridolfo* determines an “overall probability of a valve defect” using signal strengths. As a result, modifying *Eryurek* with *Ridolfo* fails to disclose, teach, or suggest the claimed invention as recited in Claims 1, 9, 15, and 22.

For these reasons, the Office Action has not established a *prima facie* case of obviousness against Claims 1, 9, 15, and 22 (and their dependent claims).

Claim 24 recites identifying “one or more indicators of a possible defect in [a] valve,”

identifying “one or more stiction patterns using the one or more indicators,” and generating “one or more indexes associated with one or more of the stiction patterns.”

The Office Action acknowledges that *Eryurek* fails to disclose “detecting stick-slip type of valve defect.” (*Office Action, Page 8, Fifth paragraph*). The Office Action then asserts that *Ohtsuka* discloses these elements and that it would be obvious to combine *Eryurek* and *Ohtsuka*. (*Office Action, Page 8, Sixth and seventh paragraphs*).

It is unclear which elements of *Eryurek* are relied upon by the Patent Office as anticipating the “one or more indicators of a possible defect in [a] valve” as recited in Claim 24. It appears that the Office Action relies on one or more of the decomposition levels in Figure 5 of *Eryurek* as anticipating the “one or more indicators of a possible defect in the valve.” However, the decomposition levels in Figure 5 of *Eryurek* are produced by processing a sensor signal with a discrete wavelet transform. (*Par. [0025]*). In contrast, *Ohtsuka* specifically recites that “high-frequency components appear in a signal for indicating the displacement of [a] movable member” in the event of a “stick-slip” and that the “occurrence of the high-frequency components can be detected by analyzing the signal ... by Fourier transform.” (*Col. 3, Lines 8-14*).

The Office Action does not explain how “high-frequency components” in the decomposition level of *Eryurek* can be used to identify one or more “stiction events.” In particular, *Ohtsuka* uses a Fourier transform on an original displacement signal. *Ohtsuka* does not recite using a Fourier transform on a wavelet decomposition level produced by decomposing the displacement signal. The Office Action has not established that *Ohtsuka* would function

properly if a Fourier transform was applied to a wavelet decomposition level. Rather, in order for *Ohtsuka* to operate correctly in the combined *Eryurek-Ohtsuka* system, it appears that the system of *Eryurek* would need to generate the decomposition levels using a sensor signal and separately perform a Fourier transform on the original sensor signal. As a result, the decomposition levels of *Eryurek* would not anticipate the “one or more indicators of a possible defect in the valve” as recited in Claim 24 because the decomposition levels of *Eryurek* could not be used in combination with *Ohtsuka*.

For these reasons, the Office Action has not established a *prima facie* case of obviousness against Claim 24 (and its dependent claims).

Accordingly, the Applicants respectfully request withdrawal of the § 103 rejections and full allowance of Claims 1-3, 6, 7, 9, 10, 12, 13, 15, 16, 18, 19, and 22-24.

III. CONCLUSION

The Applicants respectfully assert that all pending claims in this application are in condition for allowance and respectfully request full allowance of the claims.

SUMMARY


If any issues arise, or if the Examiner has any suggestions for expediting allowance of this application, the Applicants respectfully invite the Examiner to contact the undersigned at the telephone number indicated below or at *wmunck@davismunck.com*.

The Commissioner is hereby authorized to charge any additional fees connected with this communication (including any extension of time fees) or credit any overpayment to Deposit Account No. 50-0208.

Respectfully submitted,

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Date: Feb. 22, 2005



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